3-4310-100-10

TM 3-4310-100-10

TECHNICAL MANUAL

OPERATOR'S MANUAL

COMPRESSOR UNIT, RECIPROCATING: POWER-DRIVEN, FLAMETHROWER, 3½ CFM,

AN-M4 (Walter Kidde)
NSN 4310-00-592-8560

AN-M4B (Stewart-Warner)
NSN 4310-00-848-6075

AN-M4C (Stewart-Warner)
NSN 4310-00-078-5431

AN-M4D (Walter Kidde)
NSN 4310-00-181-5054

HEADQUARTERS, DEPARTMENT OF THE ARMY
NOVEMBER 1976

D101.11:

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WARNINGS

Don't use these air compressors to pressurize air cylinders or tanks that are used to supply breathable air. Air from these compressors can contain hazardous vapors and impurities which could cause damage to the respiratory system or death.

CARBON MONOXIDE POISONING CAN BE DEADLY. Carbon monoxide is in exhaust gases of internal combustion engines, and becomes dangerously concentrated under conditions of inadequate ventilation. Exposure to air contaminated with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, drowsiness, and possible coma. Permanent brain damage or DEATH can result from severe exposure. Operate the compressor unit in well ventilated areas or with the engine exhaust gases vented to the outdoors.

2000 PSI AIR PRESSURE

is generated during operation of this equipment.

DEATH

or severe injury may result if compressor unit is not in perfect operating condition. Never use a damaged compressor unit or one that is in a questionable condition.

DEATH

or severe injury may result if the proof pressure or rating of equipment to be charged is unknown.

WARNINGS

Never charge equipment to a pressure in excess of its known rating.

To avoid injury to personnel and damage to equipment DO NOT TAMPER WITH THE PRESSURE RELIEF VALVE (fig. 1–1 and 1–2). If the safety seal is broken or missing, do not operate compressor unit. Report missing or broken safety seal to your NCOIC.

High-pressure compressed air can cause serious injury or loss of life to personnel, and severe damage to equipment. Exercise extreme caution when in the charging process.

Open condensate valve with caution. The oil, water, and air emulsion released under pressure can cause injury to personnel.

Gasoline is highly flammable, and can cause severe burns or DEATH. Stop gasoline engine

before attempting to refill fuel tank. Avoid spilling gasoline on hot engine.

Operating personnel must always position themselves away from the charging hose assembly during charging operations. If either the charging hose or connector fail, the remaining portion of the charging hose will whip around and may injure personnel in its path.

See that the locking collar on the quick-disconnect coupling half is fully retracted and resting against the first wrenching surface. Do not push locking collar forward since this will release the coupling half from the charging fitting.

This compressor unit generates a potentially hazardous noise level of 96 decibels. The operator and others in the immediate area will wear earplugs which have been fitted by medical personnel.

*TM 3-4310-100-10

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DEPARTMENT OF THE ARMY
WASHINGTON, DC, 12 November 1976

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COMPRESSOR UNIT, RECIPROCATING: POWER-DRIVEN, FLAMETHROWER, 3½ CFM,

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You can improve this manual by recommending improvements using DA Form 2028 (Recommended Changes to Puplications and Blank Forms) or a letter, and mailing direct to Commander, Edgewood Arsenal, Attn: SAREA-DE-ET, Aberdeen Proving, MD 21010. A reply will be furnished direct to you.

* This manual supersedes TM 3-1040-244-10, 26 October 1973, in its entirety, and so much of TM 3-1040-210-12, 15 February 1963, and TM 3-1040-263-12, 21 September 1970, as pertains to operator.

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Purpose and Scope

This manual is for your use in eperating and maintaining the Compressor Units, Reciprocating: Power-Driven, 3½ CFM, AN–M4, AN–M4B, AN–M4C and AN–M4D.

1-2. Maintenance Forms and Records

Maintenance forms and records you are required to use are explained in TM 38-750.

Section II. DESCRIPTION AND DATA

1-3. Description

The compressors (figs. 1–1, 1–2) are air-cooled, self-contained, portable back-pack units. They are used for charging commercial air cylinders, portable flamethrowers, riot control disperser air tanks, vehicle-mounted air tanks and flame landmines. A starting rope and canvas cover are supplied with the equipment.

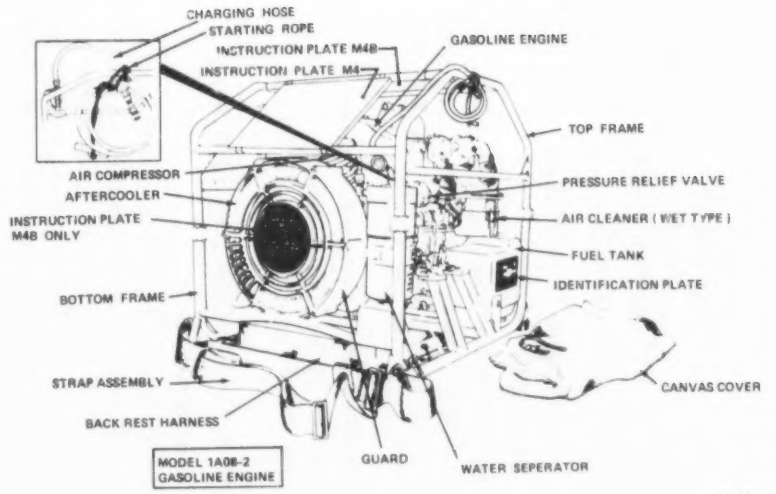


Figure 1-1. AN-M4 and AN-M4B compressor units.

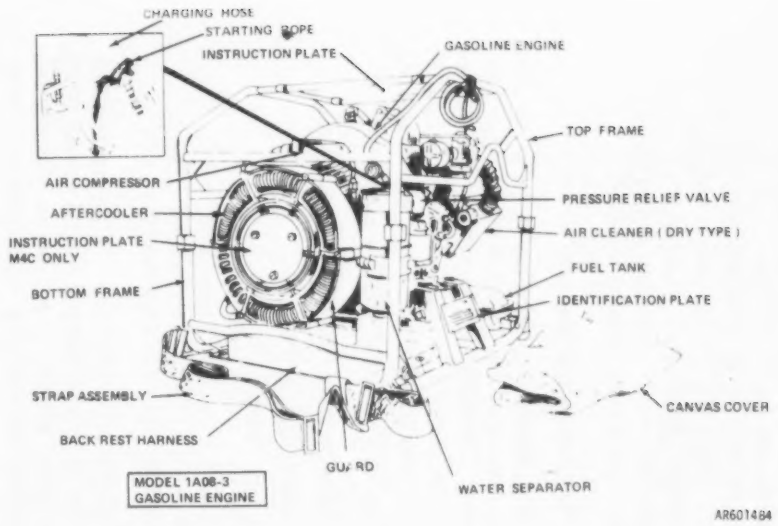


Figure 1-2. AN-M4C and AN-M4D compressor units.

WARNING

Don't use these air compressors to pressurize air cylinders or tanks which are used to supply breathable air. Air from these compressors can contain hazardous vapors and impurities which could cause damage to the respiratory system or death.

1-4. Differences in Models

The four compressor models covered in this manual are similar in appearance and performance. The differences in the models are minor and pertain to the starting, adjusting and stopping procedures. They are explained in the operating instructions.

1-5. Identification and Instruction Plates

a. Identification Plates.

AN–M4	Figure 1–1
AN–M4B	Figure 1–1
AN–M4C	Figure 1–2
AN–M4D	Figure 1–2

b. Instruction Plates. The instruction plates on all four compressor units are attached to the upper frame. These plates contain the instructions for starting, operating, and stopping the units.

1-6. Tabulated Data

a. Complete Unit.

Total weight (approx.)	68 lbs. approx.
Length	22 in. approx.
Width	17 in. approx.
Height	19 in. approx.

b. Compress.

Operating pressure	2,000 psi
Oil Reservoir capacity M4	¾ pint (350 cc)
Oil Reservoir capacity M4B, M4C, M4D	1 pint (470 cc)
Relief Valve operating pressure	2,250 psi

c. Engine.

Make	Military Standard
Model:	
IA08–2	AN–M4
	AN–M4B
IA08–3	AN–M4C
	AN–M4D

d. Fuel Tank.

Capacity (approx)	3 qts.
Fuel consumption	1 qt. per hour approx.

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. CONTROLS AND INSTRUMENTS

2-1. Controls and Instruments

For controls and instruments for all four compressor units refer to figures below:

AN–M4	Rigure 2–1
AN–M4B	Figure 2–1
AN–M4C	Figure 2–2
AN–M4D	Figure 2–2

Section II.

OPERATION UNDER USUAL CONDITIONS

2-2. General

This section contains instructions for operating the compressor units under normal climate and service conditions. Normal climate conditions are considered to be between 32° and 95°F.

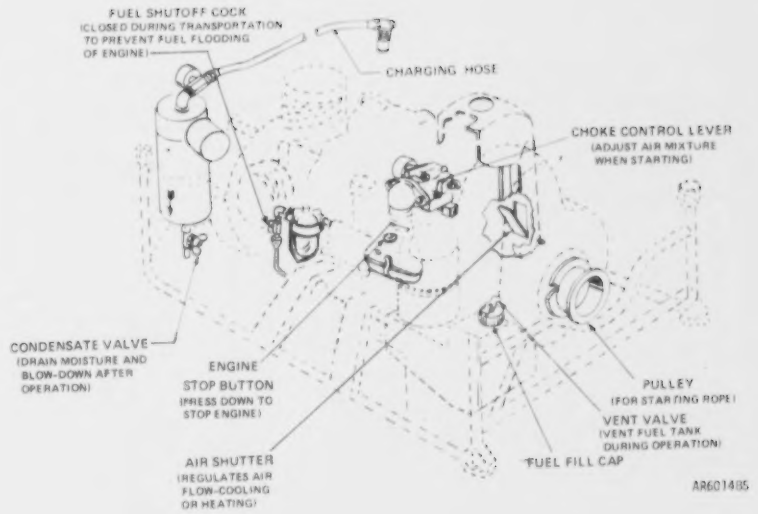


Figure 2-1. AN-M4 and AN-M4B Compressor units controls and instruments.

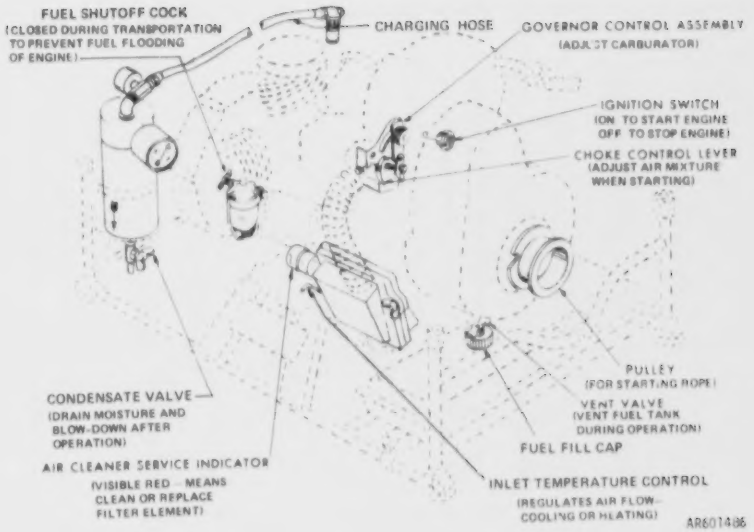


Figure 2–2. AN–M4C and AN–M4D compressor units controls and instruments.

WARNINGS

CARBON MONOXIDE POISONING CAN BE DEADLY. Carbon monoxide is in exhaust gases of internal combustion engines, and becomes dangerously concentrated under conditions of inadequate ventilation. Exposure to air contaminated with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, drowsiness, and possible coma. Permanent brain damage or DEATH can result from severe exposure. Operate the compressor unit in well ventilated areas or with the engine exhaust gases vented to the outdoors.

2000 PSI AIR PRESSURE

is generated during operation of this equipment.

DEATH

or severe injury may result if compressor unit is not in perfect operating condition. Never use a damaged compressor unit or one that is in a questionable condition.

DEATH

or severe injury may result if the

proof pressure or rating of equipment to be charged is unknown.

WARNING

Never charge equipment to a pressure in excess of its known rating.

2-3. Preparing Compressor Units for Use

a. Unbuckle securing straps and remove canvas cover.

b. Perform before-operation checks and services (table 3–1).

c. If the compressor unit is to be backpacked, refer to (fig. 2–3) (AN–M4 and AN–M4B compressor units only).

WARNING

To avoid injury to personnel and damage to equipment DO NOT TAMPER WITH THE PRESSURE RELIEF VALVE (figs. 1–1 and 1–2). If the safety seal is broken or missing, do not operate compressor unit. Report missing or broken safety seal to your NCOIC.

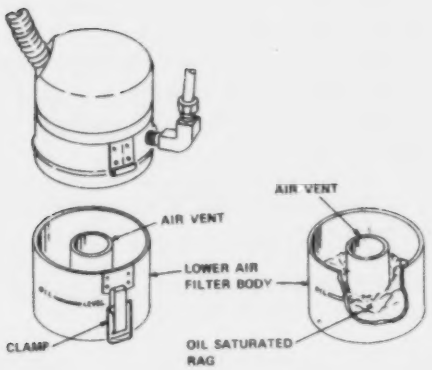
d. Open fuel shutoff cock (fig. 2–1 or 2–2).

e. Open the vent valve in the fuel fill cap.

f. Open condensate valve.

NOTE

Opening 'the condensate valve pre-



STEPS

1. Unfasten two clamps.
2. Remove lower air filter body.
3. Obtain a piece of clean rag that will fit in lower air filter body. Be sure rag will not be any higher than the marked oil line, and will not obstruct air vent.
4. Saturate rag with oil in air filter. Squeeze excess oil from rag. Discard remaining oil in air filter.
5. Place cloth in bottom of lower air filter body. Be sure cloth is not interfering with air intake.
6. Replace lower air filter body and secure with two clamps.

Figure 2-3. Preparing AN-M4 and AN-M4B compressor units for back-packing.

vents pressure buildup during starting and relieves the starting load on the gasoline engine.

g. Check oil level in both engine and compressor reservoirs (crankcase).

h. If oil level is low notify organizational maintenance.

i. Connect the charging hose assembly, attached to the water separator, to the equipment to be charged.

2-4. Starting AN-M4 and AN-M4B Compressor Units

WARNING

This compressor unit generates a potentially hazardous noise level of 96 decibels. The operator and others in the immediate area will wear earplugs which have been fitted by medical personnel.

a. Open the air shutter (fig. 2–1) on the engine blower housing.

b. Set choke control lever in closed position (toward the engine blower housing).

c. Wrap starting rope (fig. 1–1) around pulley (fig. 2–1). Pull rope to turn engine over smoothly and rapidly until it fires.

d. If engine carburetor becomes flooded, perform the following steps:

(1) Clase fuel shutoff cock.

(2) Crank engine several times or until the carburetor is cleared of excess fuel.

(3) Readjust choke for a leaner mixture to eliminate flooding; then repeat step (*c*).

e. When engine starts, adjust choke lever for proper speed and smooth operation.

f. Let engine warm up before applying load and set choke in open position.

2-5. Starting AN-M4C and AN-M4D Compressor Units

a. Set choke control lever in closed position (fig. 2–2).

b. Place governor control in START position.

c. Adjust inlet temperature control as described on air cleaner cover.

d. Turn ignition switch to RUN position.

e. Wrap starting rope assembly (fig. 1–2) around pulley (fig. 2–2). Pull rope to turn engine over smoothly and rapidly until it fires.

f. If gasoline engine becomes flooded, perform the following steps:

(1) Close fuel shutoff cock.

(2) Crank engine several times or until carburetor is cleared of excess fuel.

(3) Readjust choke for a leaner mixture to eliminate flooding; then repeat step *e*.

g. When engine starts, adjust choke control lever and governor control for proper speed and smooth operation.

h. Let engine warm up before applying load and set choke in open position.

2-6. Servicing

WARNING

High-pressure compressed air can cause serious injury or loss of life to personnel, and severe damage to equipment. Exercise extreme caution when in the charging process.

WARNING

Open condensate valve with caution. The oil, water, and air emulsion released under pressure can cause injury to personnel.

a. Open the condensate valve and let emulsion blow down at end of each charging cycle.

b. If several items are to be charged, do not stop engine.

c. Open condensate valve (figs. 2–1 and 2–2) every 30 minutes of continuous operation.

NOTE

Don't worry if the pressure relief valve relieves during charging. It

means the equipment is fully charged and you allowed excess air pressure to build up.

WARNING

Gasoline is highly flammable, and can cause severe burns or DEATH. Stop gasoline engine before attempting to refill fuel tank. Avoid spilling gasoline on hot engine.

d. Perform during-operation checks and services (table 3–1).

2-7. Stopping AN-M4, AN-M4B, AN-M4C, and AN-M4D Compressor Units

a. On AN–M4 and AN–M4B compressor units, press down engine stop button (fig. 2–1) and hold it down until engine stops.

b. On AN–M4C and AN–M4D compressor units, snap ignition switch to the OFF position (fig. 2–2).

WARNING

Open condensate valve with caution. The oil, water, and air emulsion released under pressure can cause injury to personnel.

c. Open condensate valve, and let emulsion in the water separator blow down.

NOTE

Always leave condensate valve open when compressor unit is not charging equipment.

2-8. After-Operation Services

a. Close fuel shut-off cock, and vent valve.

b. Perform after-operation checks and services (table 3–1).

c. Wipe clean the compressor unit after operation.

d. Coil charging hose assembly and tie to top frame with starting rope.

e. Place canvas cover on compressor unit and secure when engine is cool.

Section III

HOOK-UPS FOR AIR-CHARGING EQUIPMENT

2-9. Air-Charging Pressure Tank for M2A1-7 Flamethrower and M3 Disperser

(B, Fig. 2–4).

a. Attaching Charging Line to Pressure Tank.

NOTE

The following procedures apply only to the M2A1–7 Flamethrower, the M3 Riot Control Agent Disperser, and commercial air cylinders.

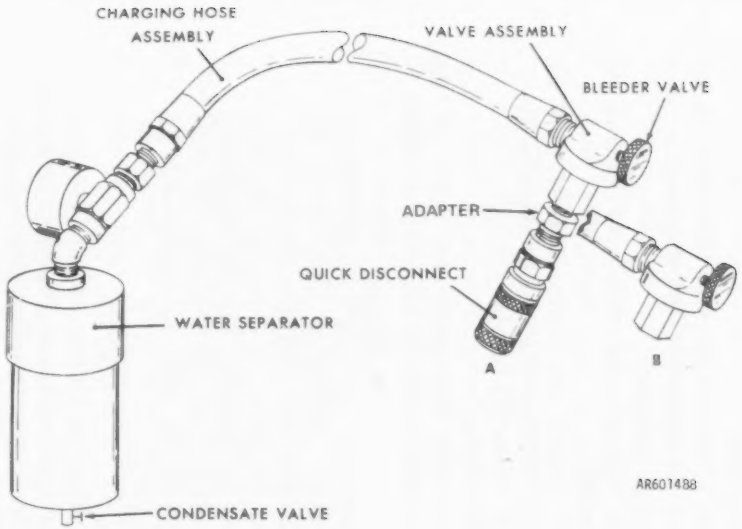


Figure 2-4. Charging hose assembly with and

(1) Unscrew the quick-disconnect coupling half from the valve assembly on the charging hose.

(2) Close the pressure tank valve on the M2A1–7 flamethrower, M3 disperser or commercial air cylinder.

(3) Unscrew the check valve cap from the check valve.

(4) Screw the valve assembly on the charging hose assembly to the check valve.

(5) Close the bleeder valve.

b. Charging.

(1) Open the condensate valve on the water separator of the AN–M4 compressor.

WARNING

Operating personnel must always position themselves away from the charging hose assembly during charging operations. If either the charging hose or connector fail, the remaining portion of the charging hose will whip around and may injure personnel in its path.

NOTE

Opening the condensate valve prevents pressure buildup during starting and relieves the starting load on the engine.

(2) Start the engine.

(3) Close the condensate valve.

(4) During charging, check the pressure gage to make sure the pressure is increasing at a uniform rate.

WARNING

Open condensate valve with caution. The oil, water, and air emulsion released under pressure can cause injury to personnel.

(5) When the pressure tank has been charged to a pressure of 2,000 psi, open the condensate valve one-half turn to permit the high-pressure air to escape and blow down the oil, water, and other material accumulated in the water separator.

(6) Stop the engine.

c. After-Charging Procedure.

(1) Open the bleeder valve one-fourth turn.

(2) Disconnect the charging-hose valve assembly from the pressure tank check valve. Replace and tighten the chack valve cap.

(3) Screw the quick-disconnect coupling half into the valve assembly on the charging hose.

2-10. Air-Charging ABC-M9-7 or M9A1-7 Flamethrower and M5 Riot Control Agent Disperser

(A, fig. 2–4).

NOTE

The following procedures apply only to the ABC–M9–7, and M9A1–7 flamethrowers and the M5 Riot Control Agent Disperser.

a. Attaching Hose Assembly to High-Pressure Sphere.

(1) Close the high-pressure sphere valve.

(2) Disconnect the pressure hose from the plug on the high-pressure sphere valve.

(3) Snap the quick-disconnect on the charging hose assembly to the high-pressure valve.

WARNING

See that the locking collar on the quick-disconnect coupling half is fully retracted and resting against the first wrenching surface. Do not push locking collar forward since this will release the coupling half from the charging fitting.

(4) Close the bleeder valve.

b. Charging.

(1) Open the condensate valve on the water separator of the compressor.

WARNING

Operating personnel must always position themselves away from the charg-

ing hose assembly during charging operations. If either the charging hose or connector fail, the remaining portion of the charging hose will whip around and may injure personnel in its path.

(2) Start the engine.

(3) Close the condensate valve.

(4) Open the high-pressure sphere valve.

(5) During charging, check the pressure gage to make sure the pressure is increasing at a uniform rate.

(6) When the high-pressure sphere has been charged to a pressure of 2,000 psi, close the high-pressure sphere valve.

WARNING

Open condensate valve with caution. The oil, water, and air emulsion released under pressure can cause injury to personnel.

(7) Open the condensate valve one-half turn.

(8) Stop the engine.

c. After-Charging Procedure.

(1) Open the bleeder valve on the charging hose one-fourth turn.

(2) Remove the charging hose from the plug on the high-pressure sphere valve.

(3) Connect the pressure hose to the plug on the high-pressure sphere valve.

Section IV.

OPERATION UNDER UNUSUAL CONDITIONS

2-11. General

This section provides the operator with additional information for proper operation of compressor units under conditions of cold and extreme cold (32°F to —40°F), extreme heat (95°F and above), sand or dust and in rainy and humid areas.

2-12. Cold and Extreme Cold

a. Fill fuel tank (fig. 1–1 and 1–2) with arctic grade gasoline.

b. Start compressor unit in an area where the temperature is above 32°F.

c. Start and operate AN–M4 and AN–M4B compressor unit with engine air shutter (fig. 2–1) closed.

d. Allow compressor and gasoline engine to warm up before applying load.

NOTE

The water separator has no provisions for preventing freezing of the oil-water-air emulsion.

e. Apply heat to external surface of water

separator and condensate valve as necessary to accomplish blow down of accumulated emulsion.

f. After operation fill fuel tank with gasoline to help reduce condensation.

2-13. Extreme Heat

The compressor unit can be operated exactly as specified in operation under usual conditions.

2-14. Sand or Dust

Use special care and handling in sandy and dusty areas, because dust and sand are highly abrasive. Keep compressor unit clear of heavy drifts of sand or dust. In the event of severe dust or sand storms, provide a well protected sheltering device for the compressor unit. Check compressor intake filter frequently for clogging. Before refueling wipe fill area clean of dust and sand. Be especially careful to remove all caked deposits from between cooling fins of compressor and gasoline engine cylinders, and from compressor aftercooler.

2-15. Rainy and Humid Areas

During operation, blow down moisture separator frequently to ensure delivery of dry air. Be especially careful to remove all caked deposits from between cooling fins of the compressor and gasoline engine cylinders and

from compressor aftercooler. Wipe moisture and mud from compressor unit after operation.

2-16. Salt Water Areas

Salt air is highly corrosive to metals and could cause a great deal of damage to compressor unit. Shelter compressor unit as much as possible from salty atmosphere to avoid corrosion of the exterior surfaces. Wash compressor unit off with fresh water and wipe dry with a clean rag.

CHAPTER 3

MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION

3-1. Compressor

Check oil level sight plug (fig. 3–1) daily to insure that level of oil is within the glass circle. Oil level on classes M4B and M4C is checked by sight plug, oil level on classes M4 and M4D is checked with dip stick. Check oil level more frequently under abnormal and severe weather conditions. Report low oil level to your NCOIC.

3-2. Gasoline Engine

After every 3 hours of operating time, remove oil rod (fig. 3–1) and check level of oil. Check oil level more frequently under abnormal and severe weather conditions. Do not remove oil level gage rod with gasoline engine operating. Report low oil level to your NCOIC.

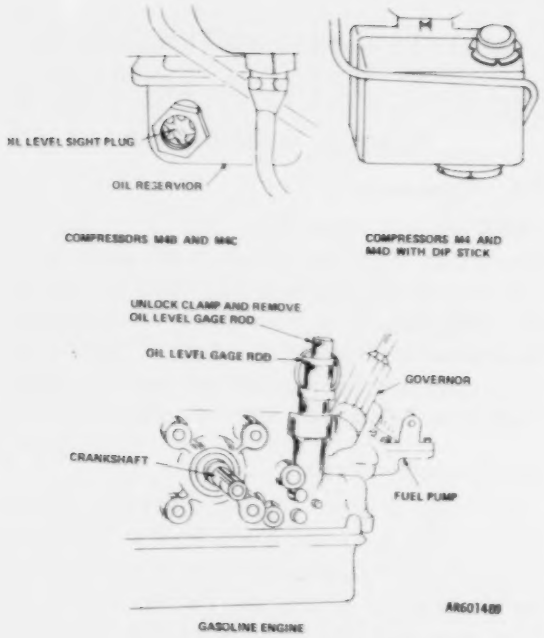


Figure 3–1. Oil check points.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

3-3. Purpose

Preventive maintenance checks and services (table 3–1), provide you with a list of maintenance services which must be performed at prescribed intervals. Use the list to make sure that all required maintenance is accomplished. If corrective action is not authorized at operator level, report equipment failures to your NCOIC.

3-4. Explanation of Columns

A number under before, during, or after operation in the "Interval and Sequence No." column indicates that the service opposite the number must be performed in the numerical sequence at the prescribed interval. The time required to perform all the checks and services of each interval is shown in the work time column. These times are stated in hours and tenths.

Table 3-1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

B—Before Operation
Time Required: 0.5

D—During Operation
Time Required: 0.3

A—After Operation
Time Required: 0.5

Interval and Sequence No.			Item to be Inspected Procedure	Work Time (M/H)
B	D	A		
1			LUBRICATION Check oil level in gasoline engine and compressor before starting, and as stated in paragraphs 3-1 and 3-2.	0.1
2			PULLEY Check the starter pulley for tightness (fig. 2-1 and 2-2).	0.1
3			INSPECTION OF EQUIPMENT Visually inspect for loose and missing hardware; fuel leaks; distorted or kinked fuel line. Remove dirt and mud clogging cooling fins.	0.1
	6		EQUIPMENT OPERATION Listen for excessive noises. Check for excessive vibration and smoke. Stop operation immediately if any of the above is detected. Keep area free of debris that could be pulled into compressor fan and cause damage.	0.1

Interval and Sequence No.			Item to be Inspected Procedure	Work Time (M/H)
B	D	A		
		9	AIR CLEANER SERVICE INDICATOR **NOTE** Model IA08–3 gasoline engine only. (M4C and M4D) Check for red signal (fig. 2–2).	0.1
4		10	FUEL TANK Check fuel supply, add or replenish fuel. Insure fuel fill cap assembly is tight. Inspect for loose or missing mounting hardware.	0.1
5		11	CONDENSATE VALVE Ensure condensate valve is open (fig. 2–1 and 2–2).	0.1
	7		Open condensate valve (fig. 2–1 and 2–2) every 30 minutes of continuous operation.	
	8		PRESSURE RELIEF VALVE Feel valve for air leaks (fig. 1–1 and 1–2).	0.1
		12	PROTECTING CAGE AND ENGINE MOUNTING FRAME Visually inspect for cracks, broken welds, and bent tubing (fig. 1–1 and 1–2). Check the bottom frame for missing or	0.1

Sequence No. and Interval			Item to be Inspected Procedure	Work Time (M/H)
B	D	A		
			loose rubber mounts. Mounts are located on bottom of bottom frame.	
		13	STRAP ASSEMBLIES, BACK REST HARNESS AND COVER ASSEMBLY Visually inspect for frayed and torn canvas material; missing and mutilated securing hardware. Distorted and damaged buckles and snaps. After compressor has cooled place cover over unit and secure.	0.1

Section III. TROUBLESHOOTING

3-5. General

Table 3–2 lists troubleshooting procedures for the operator.

3-6. Malfunctions

Each malfunction is followed by a test or inspection and corrective actions that can be taken to correct the malfunction. A malfunction that is not included in this table will be reported to your NCOIC.

Table 3–2. TROUBLESHOOTING

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. ENGINE FAILS TO START.
Step 1. Check fuel supply.
Fill fuel tank with fuel.
Step 2. Check position of ignition switch (fig. 2–2).
Turn ignition switch to run position (M4C and M4D).
Step 3. Check for closed fuel shutoff cock (fig. 2–1 or 2–2).
Open fuel shutoff cock.
Step 4. Check for improper choke lever and governor setting.
Propertly adjust choke lever and governor.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	
2.	ENGINE FAILS TO CONTINUE RUNNING
Step 1.	Check for closed fuel fill cap vent valve. Open vent valve (fig. 2–1 or 2–2).
Step 2.	Check fuel supply. Replenish fuel supply.
3.	LOW AIR PRESSURE OR LONG FILL TIME
Step 1.	Check engine operating speed. Increase engine speed.
Step 2.	Check for partially opened condensate valve. Close condensate valve (fig. 2–1 or 2–3).

Section IV. MAINTENANCE INSTRUCTIONS

3-7. Canvas Cover

The operator is authorized to replace the canvas cover.

a. Removal. Unbuckle four sercuring straps and slip canvas cover off the compressor unit.

b. Inspection. Inspect fabric for holes, tears, missing securing straps, or other indications of wear and damage. Replace a canvas cover considered inadequate for protection.

c. Installation. Installation is the reverse of removal (*a* above).

APPENDIX A

REFERENCES

TM 38–750	The Army Maintenance Management System (TAMMS)

By Order of the Secretary of the Army.

BERNARD W. ROGERS
General, United States Army
Chief of Staff

Official:

PAUL T. SMITH
Major General, United States Army
The Adjutant General

DISTRIBUTION:

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